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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,102	10/14/2004	Shinji Tsuchikawa	TSUK0010	6590
24203	7590	08/11/2005	EXAMINER	
GRIFFIN & SZIPL, PC SUITE PH-1 2300 NINTH STREET, SOUTH ARLINGTON, VA 22204			WU, IVES J	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/511,102	TSUCHIKAWA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ives Wu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/30/2005</u> .   | 6) <input type="checkbox"/> Other: _____                                    |



## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(1). Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tsuchikawa et al (US006667107B2) and Ernst et al (US003046231) and Kawase et al (US003953539).

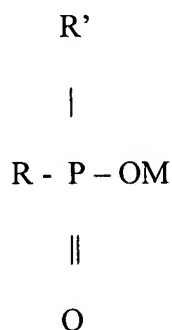
Tsuchikawa et al (US006667107B2) disclose a thermosetting resin comprising (1) a copolymer resin comprising two monomers unit, and (2) a cyanate resin having at least two cyanate groups per molecule, preferably, (3) an epoxy resin is used as a modifier, Abstract, Col. 8, line 35-36.

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As to the component (2) in the thermosetting resin composition having a dielectric constant 2.9 or less at a frequency of 1 GHz or more in the independent claim 1, Tsuchikawa et al (US006667107B2) teach a resin cured product which comprises the component (1) or (1)' and a thermosetting resin, has preferably a dielectric constant of 3.0 or less at frequency of 1 GHz or more, Col. 6, line 65 – Col. 7, line 1.

Tsuchikawa et al (US006667107B2) do not teach the component of a metal salt of disubstituted phosphinic acid in the thermosetting resin composition.

However, Ernst et al (US003046231) teach that they found the organic phosphinic acids which are useful as inhibitors having the following structure:



Where R is an aliphatic, cycloaliphatic, or aryl radical, and R' represents hydrogen, aryl or aliphatic radical, and M is hydrogen or a salt-forming radical. Col. 3, line 17-27.

Kawase et al (US003953539) also teach the phosphorus compound used in an amount sufficient to inhibit the coloration of the blend resin; Examples of phosphorus compound include phosphinic acid; mono- or disubstituted phosphinic acid; There can also be used the metal salts of phosphinic acid, phosphinous acid, and the metals selected from sodium, aluminum, Col. 3, line 31 – Col. 4, line 38.

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The benefit of using phosphinic acid and its metal salt is to inhibit the decoloration because of aging effect – that is, from becoming darker on aging. The protective agents or discoloration inhibitors employed in the process having all pronounced reducing properties. They do not interfere with the reaction completion, and rather have a reaction-promotion effect, so that they may also be described as reducing type catalysts, Col. 3, line 1-13 (Ernst et al -US003046231). In other words, more functional groups or double bonds in the thermosetting resin will be reacted, less pending functional groups or double bonds will be in the final product to improve the overall quality of the final product from deterioration, degradation by aging. Another benefit of using phosphinic acid and its metal salt is to enhance the flame retardance because phosphorus compounds are generally known as fire-retarding agents, Col. 2, line 10-11 (Kawase et al - US003953539).

Therefore, it would have been obvious at the time applicant's invention was made to include the metal salt of organic phosphinic acid salt of Kawase et al in the thermosetting resin composition of Tsuchikawa et al, because it will obtain the aforementioned benefits, moreover, the phosphinic acid salt taught by Ernst et al is genus, the metal salt of organic phosphinic acid disclosed by Kawase et al is species, one ordinary skill in the art would expect that all species works well for genus, motivated by a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

As to the limitation of dielectric constant of the thermosetting resin composition to be 3.0 or less at a frequency of 1 GHz or more in the dependent claim 2, in view of the substantially identical thermosetting resin composition disclosed by applicant's and combination of Tsuchikawa et al, Kawase et al, it is examiner's position to believe that

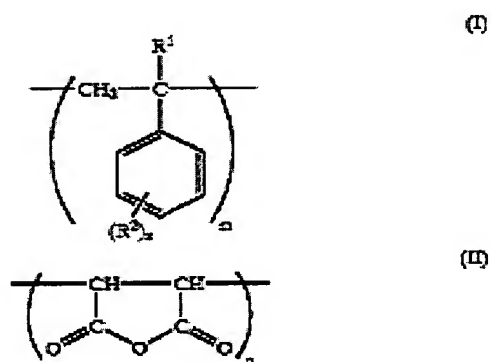
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the dielectric constant being 3.0 or less is inherently possessed by thermosetting resin compound in the combined prior arts of Tsuchikawa et al and Kawase et al. Because USPTO does not have proper means to conduct experiments, the burden of proof is now shifted to the applicant to prove otherwise. *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977).

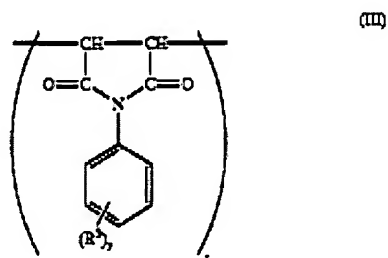
As to the limitation of dependent claim 3, Tsuchikawa et al disclose a cyanate resin having at least two cyanate groups per molecule, Abstract; Examples of the thermosetting resin include a cyanate resin having two or more cyanate groups per molecule, Col. 7, line 26-28.

As to the limitation of dependent claim 4, Tsuchikawa et al disclose a copolymer resin comprising a monomer unit (a) represented by the following general formula (I):

Abstract.



As to the limitation of dependent claim 5, Tsuchikawa et al disclose a 3<sup>rd</sup> monomer unit N-phenylmaleimide represented by the following general formula (III): Col. 2, line 39-62.



As to the limitation of dependent claim 6, Tsuchikawa et al disclose preferably that an epoxy resin of the 3<sup>rd</sup> component is used as a modifier, Col. 8, line 35-36.

As to the limitation of dependent claim 7, Tsuchikawa et al disclose the prepreg of the present invention comprising a base material impregnated or coated with the above-stated thermosetting resin composition of the present invention, Col. 9, line 58-60.

As to the limitation of dependent claim 8, Tsuchikawa et al disclose to subject prepreg of present invention to laminate molding forming the laminated sheet.

(2). As to the limitation of independent claim 9, the disclosure of Tsuchikawa et al is incorporated herein by reference. The most subject matter of dielectric constant being 3.0 or less in the thermosetting composition in applicant's claim 9 has been recited in applicant's claim 2 and has been discussed in paragraph (1) – claim 2.

As to the limitation of dependent claim 10, the disclosure of Tsuchikawa et al is incorporated herein by reference. The most subject matter of 3<sup>rd</sup> thermosetting resin nitrogen atom-containing resin contained in the thermosetting composition in applicant's claim 10 has been recited in applicant's claim 3 and has been discussed in paragraph (1) – claim 3.

As to the limitation of dependent claim 11, the disclosure of Tsuchikawa et al is incorporated herein by reference. The most subject matter of copolymer resin (2-1) component in the thermosetting composition in applicant's claim 11 has been recited in applicant's claim 4 and has been discussed in paragraph (1) – claim 4.

As to the limitation of dependent claim 12, the disclosure of Tsuchikawa et al is incorporated herein by reference. The most subject matter of epoxy resin component in the thermosetting composition in applicant's claim 12 has been recited in applicant's claim 6 and has been discussed in paragraph (1) – claim 6.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).




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Examiner: Ives Wu

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Date: August 8, 2005

  
DAVID W. WU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700